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APPLICANT : HITACHI LTD;

INVENTOR : NAKAGAWA KIYOKAZU;

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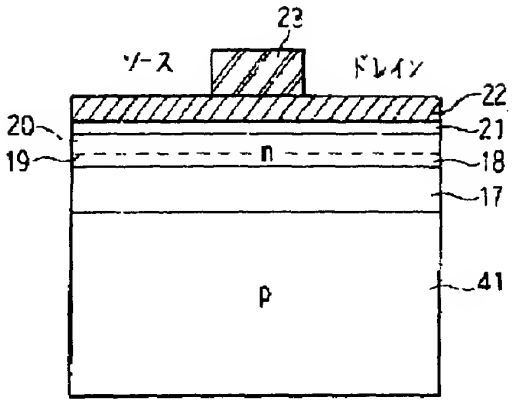
TITLE : SEMICONDUCTOR DEVICE AND ITS MANUFACTURE



ABSTRACT : PURPOSE: To obtain the title semiconductor device provided with an n-channel GET whose high-speed electron mobility can be utilized effectively by forming the n-channel FET composed of the following: a substrate composed of an SiGe mixed crystal; a channel layer which has been formed on it and which is composed of Ge or an SiGe mixed crystal; an SiGe mixed crystal layer; and a gate electrode.

CONSTITUTION: The title semiconductor device is provided with the following: a substrate 41 composed of an $Si_{1-x}Ge_x$ (where $0.7 \leq x \leq 0.85$) mixed crystal; and a channel layer 17 which is formed on the substrate 41 and which is composed of Ge or an $Si_{1-z}Ge_z$ (where $0.9 \leq z < 1$) mixed crystal. In addition, the title semiconductor device is provided with an n-channel FET which is constituted of the following: $Si_{1-y}Ge_y$ (where $0.7 \leq y \leq 0.85$) mixed crystal layers 18, 20 formed on the channel layer 17; and a gate electrode 23 provided so as to form a channel in the channel layer 18. For example, a Ge channel layer 17 and an $Si_{0.2}Ge_{0.8}$ layer 18 are epitaxially grown on a p-type $Si_{0.2}Ge_{0.8}$ substrate 41. Then, Sb 19 is controlled to be a monoatomic layer or lower and adsorbed; after that, an $Si_{0.2}Ge_{0.8}$ layer 20 and an Si layer 21 are deposited.